THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants:	Okae et al.
Appl. No.:	10/646,226
Conf. No.:	1391
Filed:	August 22, 2003
Title:	POSITIVE ACTIVE MATERIAL AND NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY
Art Unit:	1729
Examiner:	Alix E. Echelmeyer
Docket No.:	3712174-00424

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Appellants submit this Appeal Brief in support of the Notice of Appeal filed on February 11, 2011. This Appeal is taken from the Final Rejection dated July 20, 2010 and the Notice of Panel Decision from Pre-Appeal Brief Review dated March 21, 2011.

I. REAL PARTY IN INTEREST

The real party in interest for the above-identified patent application on Appeal is Sony Corporation by virtue of Assignments dated December 12, 2003 and December 15, 2003 and recorded at reel 014869, frames 0822-0824 in the United States Patent and Trademark Office.

II. RELATED APPEALS AND INTERFERENCES

Appellants' legal representative and the Assignee of the above-identified patent application do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision with respect to the above-identified Appeal.

III. STATUS OF CLAIMS

Claims 6-7, 9-10, 12-14, 16-17, 19-20 and 22-23 are pending in the above-identified patent application. Claims 1-5, 8, 11, 15, 18 and 21 were previously canceled without prejudice or disclaimer. Claims 6-7, 9-10, 12-14, 16-17, 19-20 and 22-23 stand rejected. Therefore, Claims 6-7, 9-10, 12-14, 16-17, 19-20 and 22-23 are being appealed in this Brief. A copy of the appealed claims is included in the Claims Appendix.

IV. STATUS OF AMENDMENTS

A non-final Office Action was mailed on July 20, 2010, in which the Examiner rejected Claims 6-7, 9-10, 12-14, 16-17, 19-20 and 22-23 under 35 U.S.C. §103. Appellants filed a Response to the non-final Office Action on October 20, 2010, in which Appellants argued against the obviousness rejections. A final Office Action was mailed on November 12, 2010, in which the Examiner maintained her rejections of Claims 6-7, 9-10, 12-14, 16-17, 19-20 and 22-23 under 35 U.S.C. §103. Appellants filed a Notice of Appeal and Pre-Appeal Brief in response to the final Office Action on February 11, 2011, in which Appellants argued against the obviousness rejections. The Patent Office issued a Notice of Panel Decision from Pre-Appeal Brief Review on March 21, 2011 maintaining its obviousness rejections.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A summary of the invention by way of reference to the specification and/or figures for each of the independent claims is provided as follows:

Claim 6 is directed to a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120) comprising: one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound such that the olivine compound forms a layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), and wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4, paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118).

Claim 12 is directed to a non-aqueous electrolyte secondary battery (Abstract, lines 11-16; page 1, paragraphs 2 and 11; pages 1-2, paragraph 14; page 2, paragraphs 20, 22, 25-26 and 30; page 3, paragraphs 35-36 and 38-39; pages 4-5, paragraph 55; page 5, paragraphs 56-57 and 60-61; page 6, paragraphs 70-73 and 84; pages 6-7, paragraph 85; page 7, paragraphs 88, 90-91

and 97; page 8, paragraphs 105, 113 and 116; pages 8-9, paragraph 117; page 9, paragraphs 120-121) comprising: a positive electrode (pages 1-2, paragraph 14; page 2, paragraphs 30-31; page 3, paragraph 35; page 5, paragraph 57; page 6, paragraphs 70, 74 and 81; page 7, paragraphs 92-98) including a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120); a negative electrode (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 58 and 61; page 6, paragraphs 70 and 82; page 7, paragraphs 99-100) containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material (pages 1-2, paragraph 14; page 5, paragraph 59); and a non-aqueous electrolyte (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 62-68; page 6, paragraphs 69-70 and 83; page 8, paragraphs 104-105); wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound such that the olivine compound forms a layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), and wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4,

paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118).

Claim 16 is directed to a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120) comprising: one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound in the form of a complex prepared by agitation accompanying strong friction and impact force (page 6, paragraphs 78-79) such that the olivine compound forms a layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), and wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4, paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118).

Claim 19 is directed to a non-aqueous electrolyte secondary battery (Abstract, lines 11-16; page 1, paragraphs 2 and 11; pages 1-2, paragraph 14; page 2, paragraphs 20, 22, 25-26 and 30; page 3, paragraphs 35-36 and 38-39; pages 4-5, paragraph 55; page 5, paragraphs 56-57 and 60-61; page 6, paragraphs 70-73 and 84; pages 6-7, paragraph 85; page 7, paragraphs 88, 90-91

and 97; page 8, paragraphs 105, 113 and 116; pages 8-9, paragraph 117; page 9, paragraphs 120-121) comprising: a positive electrode (pages 1-2, paragraph 14; page 2, paragraphs 30-31; page 3, paragraph 35; page 5, paragraph 57; page 6, paragraphs 70, 74 and 81; page 7, paragraphs 92-98) including a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120); a negative electrode (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 58 and 61; page 6, paragraphs 70 and 82; page 7, paragraphs 99-100) containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material (pages 1-2, paragraph 14; page 5, paragraph 59); and a non-aqueous electrolyte (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 62-68; page 6, paragraphs 69-70 and 83; page 8, paragraphs 104-105), wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound in the form of complex prepared by agitation accompanying strong friction and impact force (page 6, paragraphs 78-79) such that the olivine compound forms a layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), and

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4, paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118).

Claim 22 is directed to a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120) comprising: one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein: the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound such that the olivine compound forms a layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4, paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), the particles of lithium nickelate having a diameter of about 10 to about 20 μm (page 4, paragraph 50; page 7, paragraph 96; page 8, paragraph 115; page 9, paragraph 119), and the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed (page 4, paragraphs 50-53; page 6, paragraph 75).

Claim 23 is directed to a non-aqueous electrolyte secondary battery (Abstract, lines 11-16; page 1, paragraphs 2 and 11; pages 1-2, paragraph 14; page 2, paragraphs 20, 22, 25-26 and 30; page 3, paragraphs 35-36 and 38-39; pages 4-5, paragraph 55; page 5, paragraphs 56-57 and 60-61; page 6, paragraphs 70-73 and 84; pages 6-7, paragraph 85; page 7, paragraphs 88, 90-91 and 97; page 8, paragraphs 105, 113 and 116; pages 8-9, paragraph 117; page 9, paragraphs 120-121) comprising: a positive electrode (pages 1-2, paragraph 14; page 2, paragraphs 30-31; page 3, paragraph 35; page 5, paragraph 57; page 6, paragraphs 70, 74 and 81; page 7, paragraphs 92-98) including a positive active material (Abstract, lines 1-5; page 1, paragraphs 2, 11 and 13; page 2, paragraphs 15, 29 and 31; page 3, paragraphs 32, 36-38 and 40-41; page 4, paragraphs 42 and 48-49; pages 4-5, paragraph 55; page 6, paragraphs 72, 77 and 81; page 7, paragraphs 90-91, 93 and 95-97; page 8, paragraphs 114-116; page 9, paragraphs 118-120); a negative electrode (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 58 and 61; page 6, paragraphs 70 and 82; page 7, paragraphs 99-100) containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material (pages 1-2, paragraph 14; page 5, paragraph 59); and a non-aqueous electrolyte (pages 1-2, paragraph 14; page 2, paragraph 30; page 5, paragraphs 62-68; page 6, paragraphs 69-70 and 83; page 8, paragraphs 104-105), wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof (Abstract, lines 5-9; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 32-33; page 6, paragraphs 72 and 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118); and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof (Abstract, lines 9-11; page 1, paragraph 13; pages 1-2, paragraph 14; page 3, paragraphs 35-40; page 6, paragraphs 72 and 74-75; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the surface of the particles of lithium nickelate are uniformly covered (page 1, paragraphs 12-13; pages 1-2, paragraph 14; page 2, paragraphs 15, 17 and 19; page 3, paragraphs 32 and 41-42; pages 3-4, paragraph 43; page 4, paragraph 45; page 6, paragraphs 72, 75-76 and 78-79; page 7, paragraph 95; page 8, paragraph 114; page 9, paragraph 118) with the olivine compound such that the olivine compound forms a

layer (page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119) having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles (page 4, paragraph 54; page 7, paragraph 96; page 8, paragraph 115; page 8, paragraph 119), wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% (page 4, paragraphs 45-46; page 6, paragraph 74; page 7, paragraph 93; page 8, paragraph 114; page 9, paragraph 118), wherein the particles of lithium nickelate have a diameter of about 10 to about 20 μm (page 4, paragraph 50; page 7, paragraph 96; page 8, paragraph 115; page 9, paragraph 119), and wherein the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed (page 4, paragraphs 50-53; page 6, paragraph 75).

Although specification citations are given in accordance with C.F.R. 1.192(c), these reference numerals and citations are merely examples of where support may be found in the specification for the terms used in this section of the Brief. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification. As demonstrated by the references numerals and citations below, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology as is done here to comply with rule 1.192(c) does not in any way limit the scope of the claims to those examples from which they find support. Nor does this exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from the specification. In short, the references numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 6-7, 9, 12-13, 16-17, 19-20 and 22-23 are rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication No. 2002-075368 to Yamaura ("*Yamaura*") in view of U.S. Patent No. 6,258,483 B1 to Abe ("*Abe*") and International Patent Publication No. WO 00/02280 to Kurose et al. ("*Kurose*") as evidenced by U.S. Patent Publication No. 2002/0192137 to Chaloner-Gill et al. ("*Chaloner-Gill*")

2. Claims 10 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Yamaura* in view of *Abe* and *Kurose* and as evidenced by *Chaloner-Gill*, and further in view of U.S. Patent No. 6,391,493 to Goodenough et al. ("*Goodenough*").

VII. ARGUMENT

A. LEGAL STANDARDS

1. Obviousness under 35 U.S.C. § 103

The Federal Circuit has held that the legal determination of an obviousness rejection under 35 U.S.C. § 103 is:

> whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made…The foundational facts for the prima facie case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary skill in the art…Moreover, objective indicia such as commercial success and long felt need are relevant to the determination of obviousness…Thus, each obviousness determination rests on its own facts.

In re Mayne, 41 U.S.P.Q. 2d 1451, 1453 (Fed. Cir. 1997).

In making this determination, the Patent Office has the initial burden of proving a *prima facie* case of obviousness. *In re Rijckaert*, 28 U.S.P.Q. 2d 1955, 1956 (Fed. Cir. 1993). This burden may only be overcome "by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings." *In re Fine*, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). "If the examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent." *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1444 (Fed. Cir. 1992).

Moreover, the Patent Office must provide explicit reasons why the claimed invention is obvious in view of the prior art. The Supreme Court has emphasized that when formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. *KSR v. Teleflex*, 127 S. Ct. 1727 (2007).

Of course, references must be considered as a whole and those portions teaching against or away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). "A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged

from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant." *Monarch Knitting Machinery Corp. v. Fukuhara Industrial Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998), quoting, *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

B. THE CLAIMED INVENTION

Independent Claim 6 is directed to a positive active material comprising one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

Independent Claim 12 is directed to a non-aqueous electrolyte secondary battery comprising a positive electrode including a positive active material, a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material, and a non-aqueous electrolyte. The positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

Independent Claim 16 is directed to a positive active material comprising one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound in the form of a complex prepared by agitation accompanying strong friction and impact force such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

Independent Claim 19 is directed to a non-aqueous electrolyte secondary battery comprising a positive electrode including a positive active material, a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material, and a non-aqueous electrolyte. The positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound in the form of complex prepared by agitation accompanying strong friction and impact force such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

Independent Claim 22 is directed to a positive active material comprising one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is

selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%. The particles of lithium nickelate have a diameter of about 10 to about 20 μm, and the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed.

Independent Claim 23 is directed to a non-aqueous electrolyte secondary battery comprising a positive electrode including a positive active material, a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material, and a non-aqueous electrolyte. The positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof, and an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof. The surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles. A content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%. The particles of lithium nickelate have a diameter of about 10 to about 20 μm, and the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed.

C. THE REJECTION OF CLAIMS 6-7, 9, 12-13, 16-17, 19-20 AND 22-23 UNDER 35 U.S.C. §103(a) TO *YAMAURA*, *ABE* AND *KUROSE* SHOULD BE REVERSED BECAUSE THE EXAMINER HAS FAILED TO ESTABLISH A PRIMA FACIE CASE OF OBVIOUSNESS

Appellants respectfully submit that the obviousness rejection of Claims 6-7, 9, 12-13, 16-17, 19-20 and 22-23 should be reversed because the Examiner has failed to establish a *prima facie* case of obviousness. In the final Office Action, the Examiner asserts that the combination of *Yamaura*, *Abe* and *Kurose* renders the claimed subject matter obvious. See, Final Office Action, pages 2-5 and 6-7. However, the Examiner has failed to establish a *prima facie* case of obviousness because, even if combinable, the cited references fail to disclose each and every element of the present claims. Moreover, one of ordinary skill in the art would have no reason to combine the cited references to arrive at the present claims.

1. The Cited References Fail to Disclose Every Element of Independent Claims 6, 12, 16, 19 and 22-23 and Claims 7, 9, 13, 17 and 20 that Depend Therefrom

Independent Claims 6, 12, 16, 19 and 22-23 recite, in part, a positive active material wherein: the surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles, and a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%. By uniformly covering the surface of the lithium nickelate particles with the claimed amount of olivine compound and forming a layer having the claimed thickness surrounding the lithium nickelate particles, rather than merely adhering the olivine compound at random to the lithium nickelate particle surfaces, a battery having an improved charge/discharge capacity and high-temperature stability can be obtained. See, Specification, page 2, paragraph 19; page 3, paragraph 42; page 4, paragraphs 45-46 and 53-54. The lithium nickelate particles may be uniformly covered with the olivine compound by mixing the claimed amount of materials together using a strong impact force such as a disk mill, a mixer/crusher or a high speed agitator/mixer. See, Specification, page 7, paragraph 93; page 9, paragraph 118. In contrast, even if combinable, *Yamaura*, *Abe* and *Kurose* fail to disclose each and every element of the present claims.

For example, Appellants respectfully submit that, even if combinable, the combination of *Yamaura*, *Abe* and *Kurose* fails to disclose or suggest a positive active material wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound to form a layer around the lithium nickelate particles, and a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% as recited, in part, by independent Claims 6, 12, 16, 19 and 22-23. The Examiner asserts that *Yamaura* discloses coating $LiNi_{1-x}M_xO_2$ particles with $LiFePO_4$ particles and mixing the particles in a hybridization system using the same method as the present Specification, and thus the resulting product would be the same. See, Final Office Action, page 3, lines 1-5. The Examiner admits that *Yamaura* fails to teach the claimed amount of olivine compound but nevertheless relies on *Abe* for the teaching to optimize the amount of olivine compound in the positive active material of *Yamaura*. See, Final Office Action, page 3, lines 13-21.

However, *Abe* is entirely directed to an alkaline secondary battery including a positive electrode formed by dispersing nickel hydroxide powder in an aqueous solution of strongly acidic cobalt salt and precipitating cobalt hydroxide to form an active material in which cobalt hydroxide is mixed in the nickel hydroxide particles. See, *Abe*, Title; Abstract; column 1, lines 10-13; column 3, lines 37-50. The portion of *Abe* relied on by the Examiner merely teaches varying the amount of cobalt hydroxide coated on a nickel hydroxide active material. See, *Abe*, column 13, lines 38-56. *Yamaura* discloses that 96.7 wt% of olivine compound are mixed with its lithium nickelate particles (30.0 g of olivine compound and 1.0 g of lithium nickelate) in order to cover the front face of its particles with the olivine compound. See, *Yamaura*, paragraphs 54-55. Like *Yamaura*, other prior art methods of mixing lithium nickelate and olivine compound taught that more than 50 wt% of olivine compound was required to obtain the desired amount of high temperature stability. See, Specification, page 1, paragraph 10. Nowhere do *Yamaura* or *Abe* teach or even suggest that a much smaller amount of olivine compound, 5-50 wt%, may be mixed with lithium nickelate particles using the method of *Yamaura* to obtain uniformly covered particles. As such, Appellants respectfully submit that, even if combinable, the cited references fail to disclose or suggest a positive active material wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound and a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% as required, in part, by Claims 6, 12, 16, 19 and 22-23.

2. The Skilled Artisan Would Have No Reason to Combine the Cited References to Arrive at the Present Claims

Appellants also respectfully submit that one of ordinary skill in the art would have no reason to combine the combine the teachings of *Abe* with the positive active material of *Yamaura* to arrive at the present claims with a reasonable expectation of success. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art." See, M.P.E.P. §2143.01(III) (2010). "Evidence showing there was no reasonable expectation of success may support a conclusion of nonobviousness." See, M.P.E.P. §2143.02(II) (2010).

The Examiner asserts that "[o]ne of ordinary skill in the art could have applied the improvement of *Abe* of determining the best ratio [of] coating to base particle to the ratio of nickelate to LiFe[P]O_4 in *Yamaura* and the results would have been predictable." See, Final Office Action, page 3, lines 19-21. However, *Yamaura* is entirely directed to adhering $LiFePO_4$ particles to the front face of its lithium nickelate particles. See, *Yamaura*, paragraphs 8, 10-14, 40 and 43. *Yamaura* teaches that 96.7 wt% of olivine compound must be mixed with its lithium nickelate particles (30.0 g of $LiFePO_4$ and 1.0 g of lithium nickelate) to cover the front face of its particles with the olivine compound. See, *Yamaura*, paragraphs 53-55. Prior art methods of mixing lithium nickelate and olivine compound, such as that of *Yamaura*, taught that more than 50 wt% of olivine compound was required to obtain the desired amount of high temperature stability. See, Specification, page 1, paragraph 10.

In contrast, *Abe* is concerned with improving the charge and discharge characteristics of an alkaline secondary battery by forming a positive active material in which cobalt hydroxide is mixed in the nickel hydroxide. See, *Abe*, Title; Abstract; column 1, lines 9-12; column 3, lines 37-65. Nowhere does *Abe* teach coating lithium nickelate particles with an olivine compound or even coating its nickel hydroxide particles by mixing the cobalt hydroxide and nickel hydroxide using a strong impact force such as a disk mill, a mixer/crusher or a high speed agitator/mixer – instead, *Abe* merely discloses coating its nickel hydroxide particles by precipitation of cobalt hydroxide. See, *Abe*, Abstract; column 3, lines 51-65; column 13, lines 38-56. As such, one of ordinary skill in the art would have no reasonable expectation of success in varying the amount of olivine compound in the positive active material of *Yamaura* to arrive at the claimed range based on the teachings of *Abe*.

Appellants respectfully submit that what the Examiner has done here is to apply hindsight reasoning by attempting to selectively piece together teachings of each of the references in an attempt to recreate what the claimed invention discloses. Appellants also submit that if it were proper for the Examiner to combine any references to arrive at the present claims simply because each reference suggests an element of the present claims, then every invention would effectively be rendered obvious. Instead, the skilled artisan must have a reason to combine the cited references to arrive at the present claims. Appellants respectfully submit that such a reason is not present in the instant case.

Accordingly, Appellants respectfully request that the rejection of Claims 6-7, 9, 12-13, 16-17, 19-20 and 22-23 under 35 U.S.C. §103(a) to *Yamaura*, *Abe* and *Kurose* be reconsidered and withdrawn.

D. THE REJECTION OF CLAIMS 10 AND 14 UNDER 35 U.S.C. §103(a) TO *YAMAURA*, *ABE*, *KUROSE* AND *GOODENOUGH* SHOULD BE REVERSED BECAUSE THE EXAMINER HAS FAILED TO ESTABLISH A PRIMA FACIE CASE OF OBVIOUSNESS

Appellants respectfully submit that the obviousness rejection of Claims 10 and 14 should be reversed because the Examiner has failed to establish a *prima facie* case of obviousness. Appellants respectfully submit that the patentability of Claims 6 and 12 over *Yamaura*, *Abe* and *Kurose* as discussed previously renders moot the obviousness rejection of Claims 10 and 14 that depend from Claims 6 and 12, respectively. In this regard, the cited art fails to teach or suggest the elements of Claim 10 in combination with the novel elements of Claim 6 and the elements of Claim 14 in combination with the novel elements of Claim 12.

For example, the Examiner alleges that *Goodenough* teaches $LiMnPO_4$ as a preferred olivine compound. See, Final Office Action, page 5, lines 14-22; page 6, liens 1-2. However, as discussed previously, even if combinable, *Yamaura*, *Abe* and *Kurose* fail to disclose a positive active material wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound and a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt% as required, in part, by Claims 6 and 12. Therefore, even if combinable, *Goodenough* fails to cure the deficiencies of *Yamaura*, *Abe* and *Kurose* with respect to Claims 6 and 12 from which Claims 10 and 14 depend.

Accordingly, Appellants respectfully request that the rejection of Claims 10 and 14 under 35 U.S.C. §103(a) to *Yamaura*, *Abe*, *Kurose* and *Goodenough* be reconsidered and withdrawn.

VIII. CONCLUSION

Appellants respectfully submit that the Examiner has failed to establish obviousness under 35 U.S.C. §103 with respect to independent Claims 6, 12, 16, 19 and 22-23 and Claims 7, 9-10, 13-14, 17 and 20 that depend therefrom. Accordingly, Appellants respectfully submit that the rejections are erroneous in law and in fact and should, therefore, be reversed by this Board.

The Director is authorized to charge $540 for the Appeal Brief and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712174-00424 on the account statement.

Respectfully submitted,

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Dated: April 21, 2011

CLAIMS APPENDIX

PENDING CLAIMS ON APPEAL OF U.S. PATENT APPLICATION SERIAL NO. 10/646,226

6. A positive active material comprising:

one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof,

wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles, and

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

7. The positive active material according to claim 6, wherein the olivine compound is in the form of particles, and wherein an average particle size of the particles of the olivine compound is one-half or less as compared to an average particle size of the particles of lithium nickelate.

9. The positive active material according to claim 6, wherein lithium nickelate is $LiNiO_2$.

10. The positive active material according to claim 6, wherein the olivine compound is $LiMnPO_4$.

12. A non-aqueous electrolyte secondary battery comprising:

a positive electrode including a positive active material;

a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material; and

a non-aqueous electrolyte;

wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Mn, Cu, Zn, Sn, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof,

wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles, and

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

13. The positive active material according to claim 12, wherein lithium nickelate is $LiNiO_2$.

14. The positive active material according to claim 12, wherein the olivine compound is $LiMnPO_4$.

16. A positive active material comprising:

one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof,

wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound in the form of a complex prepared by agitation accompanying strong friction and impact force such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles, and

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

17. The positive active material according to claim 16, wherein the olivine compound is in the form of particles, and wherein an average particle size of the particles of the olivine

compound is one-half or less as compared to an average particle size of the particles of lithium nickelate.

19. A non-aqueous electrolyte secondary battery comprising:

a positive electrode including a positive active material;

a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material; and

a non-aqueous electrolyte,

wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof,

wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound in the form of complex prepared by agitation accompanying strong friction and impact force such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles, and

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%.

20. The positive active material according to claim 19, wherein the olivine compound is in the form of particles, and wherein an average particle size of the particles of the olivine compound is one-half or less as compared to an average particle size of the particles of lithium nickelate.

22. A positive active material comprising:

one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine-type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from a group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof, wherein:

the surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles,

a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%,

the particles of lithium nickelate having a diameter of about 10 to about 20 μm, and

the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed.

23. A non-aqueous electrolyte secondary battery comprising:

a positive electrode including a positive active material;

a negative electrode containing a material selected from a group consisting of metal lithium, a lithium alloy, and a material allowing lithium to be doped or undoped in or from the material; and

a non-aqueous electrolyte,

wherein the positive active material includes one or more particles of lithium nickelate having a surface and having a formula $Li_yNi_{1-z}M'_zO_2$ where $0.05 \leq y \leq 1.2$ and $0 \leq z \leq 0.5$, and M' is selected from the group consisting of Fe, Co, Mn, Cu, Zn, Al, Sn, B, Ga, Cr, V, Ti, Mg, Ca, Sr and mixtures thereof; and

an olivine compound having an olivine type crystal structure and having a formula Li_xMPO_4 where $0.05 \leq x \leq 1.2$, and M is selected from the group consisting of Fe, Mn, Co, Ni, Cu, Zn, Mg and mixtures thereof,

wherein the surface of the particles of lithium nickelate are uniformly covered with the olivine compound such that the olivine compound forms a layer having a thickness of about 0.1 μm to about 10 μm around the lithium nickelate particles,

wherein a content of the olivine compound in the positive active material ranges from about 5 wt% to about 50 wt%,

wherein the particles of lithium nickelate have a diameter of about 10 to about 20 μm, and

wherein the particle size of the olivine compound disposed on the lithium nickelate particle is one-half or less of the particle size of the lithium nickelate particle on which the olivine compound is disposed.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.